

REMARKS

Claims 26-37 are pending in the application. Claims 1-25 have been canceled, and claims 26-37 have been newly added. Reconsideration of the rejection and allowance of the pending application in view of the following remarks are respectfully requested.

As an initial matter, Applicants would like to thank the Examiner for the thoroughness of his Office Action.

Applicants wish to bring to the Examiner's attention the fact that Applicants filed Information Disclosure Statements on September 20, 2001 and December 8, 2004. Applicants respectfully request that the Examiner consider all of the documents cited in the Information Disclosure Statements, and provide Applicants with an initialed copy of the PTO-1449 attached to each of the Information Disclosure Statements, indicating consideration of all of the documents cited therein.

In the Office Action, the Examiner objected to claims 4-9 and 11-25 due to awkward wording in the claim language.

The Examiner rejected claims 9 and 15 under 35 U.S.C. § 101 as being directed to non-statutory subject matter.

The Examiner also rejected claims 5, 15 and 19 under 35 U.S.C. § 112, 2nd paragraph as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicants regard as the invention.

The Examiner also rejected claims 6-9 and 11-17 under 35 U.S.C. § 102(e) as being anticipated by Laumeyer et al. (U.S. Patent No. 6,266,442).

The Examiner also rejected claims 4, 5 and 18-25 under 35 U.S.C. § 103(a) as

being unpatentable over Laumeyer in view of Higashio et al. (U.S. Patent No. 6,80,841).

In the present amendment, claims 1-25 have been canceled to expedite prosecution of the present application. Cancellation of the claims should not be viewed as Applicants conceding the propriety of the rejections.

Applicants respectfully submit that the present application is in condition for allowance for at least the following reasons.

The present invention is directed towards an object recognition apparatus. The object recognition apparatus of the present invention includes, inter alia, a plurality of cameras that each take an image of an object and obtain image data of the object. The object recognition apparatus also includes a plurality of databases. Each database is associated with one of the cameras, and stores model object data. The object recognition apparatus also includes a search range focusing section that narrows down an area in the image data where the corresponding object is likely to exist, making that area a search range. The object recognition apparatus also includes an object recognition section that compares the image data in the search range against the model data in the corresponding database, detects model data presenting a highest similarity to the image data, and detects the object in the image data using the model data. The object recognition section is provided for common use by the plurality of cameras.

Thus, the present invention is configured so that a single object recognition section is provided for a plurality of cameras, and recognizes objects by switching between databases depending on the images taken by the cameras. The present invention is thus directed to reducing the volume of hardware configuration. Thus, one

feature of the invention is to input individual image information from a plurality of cameras in one common object recognition section.

One of the advantages of the search range focusing section of the present invention is that a pattern matching process must be performed on only a reduced portion of the image data (the search range). Therefore, the load on the object recognition section is reduced, enabling faster operation.

Furthermore, another feature of the invention includes multiplying image data taken by each camera by a feature extraction matrix and finding feature vectors, and comparing these feature vectors with model feature vectors stored in the databases, thereby reducing the processing load in the object recognition section. This enables the object recognition section to recognize objects through the simple process of vector comparison.

Laumeyer relates to a processing system which is coupled to a plurality of image means 10. The image means 10 can include multiple image means having a variety of optical properties, such as focal length, aperture settings, and frame capture rate, which are tuned to capture preselected portions of a scene of interest. See col. 9, lines 49-53. The image means 10 are typically tuned so that 5-40% of the available two dimensional image frame space is captured per object when the object is "fully depicted" in a given frame. A rough estimate of the distance from the camera may be calculated if an object of known size thus fills a field of view of the image means 10. See col. 10, lines 4-12.

Laumeyer's image means 10 either zooms in on a object, or the image means 10 includes multiple image means having different focal lengths, resulting in an object filling a field of view of the image means 10. In either case, Applicants submit that

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Laumeyer's system differs from the present invention in that it does not select a reduced portion of an image captured by a camera. Rather, it "tunes", or zooms in on an object so that the object fills a field of view of an image means 10.

Furthermore, Laumeyer does not disclose providing only one object recognition section for a plurality of cameras.

Therefore, Applicants respectfully submit that Laumeyer fails to disclose (or even suggest) an object recognition apparatus that includes a search range focusing section that narrows down an area in each image data where a corresponding object is likely to exist and makes the area a search range, and an object recognition section that compares the image data in the search range in each image data against a plurality of model data in a corresponding database, where the object recognition section is provided for common use by a plurality of cameras, as recited, for example, in claim 26. For at least these reasons, claim 26 is respectfully submitted to be in condition for allowance.

Newly added dependent claims 27-29 are also submitted to be in condition for allowance for at least the reasons set forth above with respect to claim 26.

Applicants respectfully submit that Laumeyer also fails to disclose or suggest an object recognition apparatus that includes a search range focusing section that selects a reduced portion of image data generated by a camera, and an object recognition section that compares the selected portion of the image data to stored model object data, as recited in newly added claim 30. For at least these reasons, claim 30 is respectfully submitted to be in condition for allowance.

Newly added dependent claims 31-33 are also submitted to be in condition for allowance for at least the reasons set forth above with respect to claim 30.

Applicants respectfully submits that Laumeyer also fails to disclose or suggest a method for recognizing an object which includes selecting a reduced portion of image data generated by a camera, and comparing the selected portion of the image data to model object data stored in a selected database, as recited in newly added claim 34. For at least these reasons, claim 34 is respectfully submitted to be in condition for allowance.

Newly added dependent claims 35-38 are also submitted to be in condition for allowance for at least the reasons set forth above with respect to claim 34.

Applicants further submit that Higashio et al. fails to disclose or suggest that which is lacking from Laumeyer; namely, an object recognition apparatus that includes a search range focusing section that narrows down an area in each image data where a corresponding object is likely to exist and makes the area a search range, and an object recognition section that compares the image data in the search range in each image data against a plurality of model data in a corresponding database, where the object recognition section is provided for common use by a plurality of cameras, as recited, for example, in claim 26.

Applicants respectfully submit that Higashio also fails to disclose or suggest an object recognition apparatus that includes a search range focusing section that selects a reduced portion of image data generated by a camera, and an object recognition section that compares the selected portion of the image data to stored model object data, as recited in newly added claim 30.

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Applicants respectfully submits that Higashio also fails to disclose or suggest a method for recognizing an object which includes selecting a reduced portion of image data generated by a camera, and comparing the selected portion of the image data to model object data stored in a selected database, as recited in newly added claim 34.

Thus, even if one attempted to combine the teaching of the two references in the manner suggested by the Examiner, one would still fail to arrive at the present invention.

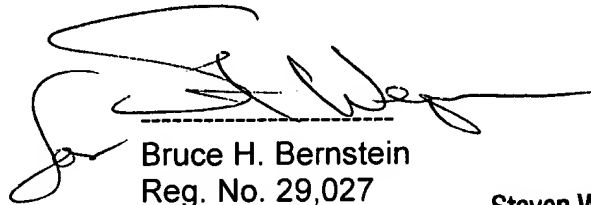
Based on the above, it is respectfully submitted that this application is now in condition for allowance, and a Notice of Allowance is respectfully requested.

SUMMARY AND CONCLUSION

Entry and consideration of the present amendment, reconsideration of the outstanding Office Action, and allowance of the present application and all of the claims therein are respectfully requested and now believed to be appropriate. Applicant has made a sincere effort to place the present invention in condition for allowance and believes that he has now done so.

Should the Examiner have any questions or comments regarding this response, or the present application, the Examiner is invited to contact the undersigned at the below-listed telephone number.

Respectfully submitted,
Mihoko SHIMANO et al.

A handwritten signature in black ink, appearing to read "Bruce H. Bernstein", is written over a horizontal dashed line.

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